

What is claimed is:

1. A method of detecting nucleic acid fragments in
5 plural samples which comprises the steps of:

attaching an electroconductive label to nucleic acid
fragments in one sample and attaching another electro-
conductive label to nucleic acid fragments in another
sample, the former electroconductive label and the latter
10 electroconductive label having oxidation-reduction poten-
tials differing from each other;

preparing a mixture of the samples containing nucle-
ic acid fragments to which electroconductive labels are
attached;

15 bringing the mixture into contact with an electro-
conductive microarray having plural electrodes onto which
probe molecules complementary to the nucleic acid frag-
ments are fixed, so that hybridization between the nucle-
ic acid fragments having electroconductive labels and the
20 probe molecules on the electroconductive microarray can
proceed to form hybrid structures on the electrodes;

applying to the electrode an electric potential
corresponding to the oxidation-reduction potential of the
former electroconductive label and detecting on the elec-
25 trode an electric current flowing along the hybrid struc-
ture;

applying to the electrode an electric potential
corresponding to the oxidation-reduction potential of the
latter electroconductive label and detecting on the elec-
30 trode an electric current flowing along the hybrid struc-
ture;

and

35 comparing the electric current detected in the for-
mer detecting procedure and the electric current detected
in the latter detecting procedure.

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2. The method of claim 1, wherein the probe molecules are nucleic acid fragments.

5 3. The method of claim 1, wherein the probe molecules are peptide nucleic acid fragments.

4. The method of claim 1, wherein the oxidation-reduction potential of the latter electroconductive label differs from the oxidation-reduction potential of the
10 former electroconductive label by at least 50 mV.

5. The method of claim 4, wherein the oxidation-reduction potential of the former electroconductive label and the oxidation-reduction potential of the latter electroconductive label both are in the range of 0 to 800 mV.
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6. The method of claim 1, wherein the detections of electric current on the electrode are conducted by differential pulse voltamography.
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7. The method of claim 1, wherein one sample is obtained from normal cells and another sample is obtained from abnormal cells corresponding to the normal cells.

25 8. The method of claim 1, wherein one sample is obtained from wild strain and another sample is mutant thereof.

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